ticular item of information required. Our author has a breezy style of expression which adds largely to the pleasure of reading the book. Take, for instance, his treatment of that all-important worry of the motorist, the "police." Mr. O'Gorman says, "to pass unchallenged at a speed in excess of the legal limit—a thing which is daily accomplished by carts, hansoms, and even by the London omnibuses on almost every run when the gradients favour them—and by almost every other vehicle everywhere—remember that by sitting upright with a calm face (on a quiet car) you produce no impression of speed except on turning a corner. If you turn a corner without being able to see down the road you are entering at over 20 miles per hour you deserve to be punished. If, however, you stoop forward (this gives the impression that you are withstanding and endeavouring to avoid a high wind pressure), jamb your hat over your eyes, screw up your face, stare intently and anxiously, do a great deal of steering with visible swinging of your body, blow your horn in such a manner as to say 'Get out of my way' frequently, instead of pressing it slowly and peaceably, you will invariably be arrested. I think a couple of good actors could safely wager to be stopped by an otherwise inoffensive constable at a pace of 10 miles per hour, especially if mounted on a machine the teeth of whose gear 'gave tongue' like a siren, after the manner of certain makes, they would as surely be fined."

The above description is quaint but true, as every motorist knows. On the other hand we find admirable descriptions and explanations of the all-important details of car management, design, &c. Our author's treatment of electric ignition is excellent, the accompanying diagrams being particularly clear. On the subject of accumulators we find much useful information, and, generally, the work contains those hundred and one wrinkles the knowledge of which goes to constitute the successful and trustworthy driver of a motor car, and we cordially recommend to all such the possession and careful perusal of this pocket-book.

N. J. L.

Weather Folk-Lore and Local Weather Signs. Prepared under the direction of Willis L. Moore, Chief U.S. Weather Bureau, by Edward B. Garriott. Pp. 153. (Washington, U.S.A.: Government Printing Office, 1903.) Price 35 cents.

THIS volume is divided practically into two parts, the first dealing solely with weather folk-lore gathered from many available sources, the second with summaries of local weather signs as based on special reports of observers to the chief of the U.S. Weather Bureau. The latter are arranged alphabetically as regards the names of the towns from which these reports are received, and deal for the most part with the prospect of fair or foul weather as indicated by the appearance of clouds, direction of wind, movements of barometer, &c. In fact, weather-folk-lore, as such, is naturally conspicuous by its absence. This portion of the work will not be of much interest to Britishers, as the signs only hold good for the particular parts of the country in question. The first portion, on the other hand, is of more general interest, as many of the quaint sayings were, so far as can be judged, the results of observation of long experience. The subject is subdivided under several different titles, according as the weather was foreshadowed by wind, barometer, clouds, humidity, temperature, &c., or by the peculiar effects of these on objects animate or inanimate. Many curious sayings, probably unfamiliar to British readers, are here collected, but one, with regard to the effects of atmospheric moisture that precedes rain, is rather gruesome. "When the locks turn damp in the scalp house surely it will rain" (American Indians).

Reference is also made to the moon as a weather prophet, to many weather proverbs of a miscellaneous kind, and to recent work on possible long-range weather forecasting.

The book concludes with a series of charts which illustrate the local weather signs as observed at regular stations of the Weather Bureau.

W. J. S. L.

The Principles of Mechanism. By Herbert A. Garratt. Pp. viii+166. (London: Edward Arnold.) Price 3*s.* 6*d.*

IN this book the author has brought together his notes of lectures delivered in connection with a course of instruction in mechanism at the Northern Polytechnic Institute, Holloway. The work is divided into two parts, dealing respectively with the kinematics and the dynamics of machines.

These notes are no doubt valuable to the compiler and useful to the students under his charge, but they seem too fragmentary to be of much service to the general reader. The descriptions of the various mechanisms are concise and to the point, but the mathematical treatment, where given, is often unsatisfactory. Moreover, there is sometimes a want of perception of the relative importance in the several items which have been introduced. Thus in the second chapter, dealing with circular and straight line motion, the fundamental subject of simple harmonic motion is not properly defined, and is dismissed with a meagre treatment extending only over one page, whilst nearly three pages are devoted to the comparatively unimportant problem of finding the crank position which corresponds with the maximum piston velocity in a steam engine, answers being given in degrees, minutes and seconds. Special constructions for velocities and accelerations such as Mohr's and Klein's are given, but these are not well explained, and the reasoning is difficult to follow; the author seems to be unaware of the fact that he is here dealing with vector quantities.

In chapter iii. the treatment of wheel teeth seems unsound. The chapter is somewhat redeemed by descriptions of gearing chains for cycles, and modern machines for cutting worm wheel teeth and bevel wheel teeth. A number of valve gears are described in chapter iv., with some applications of the Zeuner valve diagram.

Part ii. opens inauspiciously, for in the first chapter, which enunciates the general principles that are to guide the student, power and work are confused with one another, and an equation of energy is written down which involves the addition of power and kinetic energy as if they were quantities of like kind. This part includes a casual treatment of speed regulation as affected by fly wheels and governors, one or two problems on balancing, water motors, and friction. Two useful examples of axial flow turbines, with numerical data and good diagrams, are given, the information being supplied to the author by Messrs. Günther and Sons, of Oldham.

Calculating Scale, a Substitute for the Slide Rule. By W. Knowles, B.A., B.Sc. Pp. 29. (London: E. and F. N. Spon, Ltd.; New York: Spon and Chamberlain, 1903.) Price 1*s.* net.

IN this book the author provides and explains the use of two graduated scales, placed adjacent to each other for comparison and fixed together, on one of which numbers can be read off, and on the other the logarithms of the numbers, or *vice versâ*. This compound scale is 100 inches long, and is cut up into

twenty lengths, printed in successive columns, and occupies four pages of the book. This comparatively great length enables three significant figures to be read off directly from the scale divisions and subdivisions, while a fourth figure can be estimated. The author claims that computations can be made with a degree of accuracy equal to that obtained by the use of four-figure log tables, and with less trouble. We suspect, however, that few would be found who would allow this claim, or be willing to give up their tables for the author's plan. The title of the book is somewhat misleading; instead of a "substitute for the slide rule," the proper description would be, a substitute for tables of logarithms; the "calculating scale" is only an equivalent for the slide rule in the sense that a log table may be so regarded. We fail to see any useful purpose that this scale is likely to serve.

Practical Orthochromatic Photography. Photography Bookshelf, No. 14. By Arthur Payne, F.C.S. Pp. 178. (London: Iliffe and Sons, Ltd., 1903.) Price 1s. net.

IN these pages the author gives us an excellent account of the fundamental principles governing this branch of photography. Although he does not pretend to exhaust the subject, yet the reader will find that enough of the theory has been dealt with to enable him to obtain a good ground-work of the scientific principles for his own practical use. The ten chapters into which the book is divided treat of the advantages of this kind of photography, light, the use of the spectroscope, visual and photographic brightness, light filters, their use and effects, and other important subheads.

Not only is the letterpress clear, but the numerous illustrations are well chosen, and add to the utility of the volume. Those about to take up this branch of photography, and others who are practising it, should find this book a good guide.

Tombs of the Third Egyptian Dynasty at Reqâqnah and Bêt Khallâf. Report of Excavations at Reqâqnah, 1901–2. By John Garstang, B.A., B.Litt. Pp. 70+xxxiii plates. (Westminster: Archibald Constable and Co., Ltd., 1904.) Price 21s. net.

AFTER an introductory chapter describing the site of the excavations and the nature of the results, Mr. Garstang deals with the continuity of early history and the place of the third Egyptian dynasty in ancient history. Three chapters are then devoted to stairway tombs, to their construction, special features, and objects from them, respectively. The evolution of stairway tombs is discussed in a later chapter. Other sections of the volume are devoted to the necropolis, burial customs, burials under pottery vessels, objects from the smaller tombs, and the archæology of the third dynasty. There are thirty-three full-page plates containing a large number of good illustrations.

Worked Problems in Higher Arithmetic. By W. P. Workman, M.A., B.Sc., and R. H. Chope, B.A. Pp. vii+144. (London: W. B. Clive, 1904.) Price 2s.

THIS useful little book consists of two sections; in the first many of the difficult problems in the author's "Tutorial Arithmetic" are fully solved, while the second part, which will appeal more to teachers, comprises solutions of all the problems of Section xi. of the same work. The book should prove of value to the private student particularly, who is, we notice, warned that "but little benefit will accrue to him unless he makes it a regular practice to attempt to solve the questions for himself before reading the solutions here given."

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Blondlot's *n*-Rays.

FOR the past few months I have endeavoured to repeat some of Blondlot's measurements with *n*-rays, taking every precaution and following out closely the methods and adjustments described by Blondlot in his numerous papers which have appeared during the past year in the *Comptes rendus* of the Paris Academy of Sciences.

A Nernst lamp consuming 176 watts was used, which is described by Blondlot as emitting the rays most copiously. A variety of screens of phosphorescent calcium sulphide, some brilliantly phosphorescent, others very feebly so, were employed for the detection of the rays. The experiments were carried out in an absolutely dark room to which the eye had become accustomed by a wait of fifteen or twenty minutes, the only light visible being the phosphorescent glow of the screen. Lead screens, thickness ¼ inch and 1/16 inch, were used to intercept the rays, and occasionally a quartz lens was used to focus them on the screen.

But in no case could any certain difference in the brilliancy of the screen be shown to be due to the presence of the *n*-rays, although the experiments were repeated many times and under varied conditions. The only observed differences in brightness could be assigned to four known causes. If initially the sulphide was fairly bright, after a while it appeared less so, owing to the natural decay of the phosphorescence. If the phosphorescence was very feeble it appeared more brilliant by indirect than by direct vision, this being a well known phenomenon in physiological optics, which has been admirably discussed in the paper by O. Lummer, of which a translation appeared in NATURE of February 18 (p. 378).

The third effect was the increase of brightness due to the increasing sensitiveness of the eye during the first few minutes spent in a dark room, and the fourth is mentioned below. Several competent observers in England and Germany have likewise obtained negative results in looking for what Blondlot describes as being so simple, and it seems advisable to direct attention in the columns of NATURE to certain experimental precautions not sufficiently observed, perhaps, by Blondlot in the course of his work.

A slight rise in temperature increases the brilliancy of the screen. Using a screen which showed no appreciable brightening under the influence of the *n*-rays from a Nernst lamp, it was found that by heating it gently, perhaps 10 or 15 degrees centigrade, without using *n*-rays at all, the brightness increases very perceptibly, possibly 50 or 100 per cent. as nearly as could be estimated by simple observation; so that efforts to detect *n*-rays may be partially vitiated by the presence of heat effects, from the body of the observer, &c., unless special precautions are taken to show that this is negligible. Mr. S. G. Brown has brought this point forward very clearly in a recent letter to NATURE (January 28).

On reading a recent striking paper by Blondlot on the index of refraction and wave-length of *n*-rays (*Comptes rendus*, January 18), one cannot, considering the experimental conditions, fail to be impressed by the extraordinary experimental skill required to carry out what Blondlot describes.

In measuring the index of refraction, a comparatively wide slit (5 mm.) was used, placed 14 cm. from the filament of a Nernst lamp. After traversing the slit, the rays passed through an aluminium prism, and were dispersed, each homogeneous pencil spreading out into a constantly broadening beam. Now in measuring the angles of deviation there would be two difficulties to be overcome. The beams become so broad, being 1 cm. wide at a distance of 14 cm. from the slit, that the intensity is greatly weakened. Furthermore, it may be shown, by using Blondlot's actual values for the indices of refraction, and calculating backwards, so as to get the angles of deviation, by the well known formula for Descartes's method, that among the total number there are at least three consecutive beams